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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,415	08/23/2001	Kenneth C. Johnson	SEN-012	9943

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EXAMINER

SEVER, ANDREW T

ART UNIT PAPER NUMBER

2851

DATE MAILED: 04/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/938,415

Applicant(s)

JOHNSON ET AL.

Examiner

Andrew T Sever

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 August 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the spectrometer component of claim 2 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

**A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.**

2. Figures 1, 2A, and 2B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). **A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.**

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claim 2 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant claims an optical means including a spectrometer component for measuring the spectrum, although this is relatively obvious in light that the optical signature that is claimed to comprise of a reflected intensity spectrum, it is not supported by the specification as filed.

Neither in the drawings or in the specification is a spectrometer described as being present, nor is it taught or suggested how it would be incorporated into the system, one with ordinary skill in the art would not necessarily know where in the system it should be disposed.

It should further be noted, however, that a search of metrology instruments in the prior art did not show that "reflected intensity spectrum" was a known term in the art. Although this term is found in the specification (unlike the spectrometer for measuring it, which is the apparatus), the specification does not adequately define what a "reflected intensity spectrum" is in such a manner that one skilled in the art would know what kind of spectrometer would be necessary. Since this claim is not enabled, this claim will not be search further in the prior art, since one skilled in the prior art would not know what kind of spectrometer component to add to the optical means.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "low numerical aperture" in claim 3 is a relative term, which renders the claim indefinite. The term "low" is not defined by the claim, the specification does not provide a

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standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention.

Although the term “Low numerical aperture” is common in the optical arts it is generally followed by a definition of what qualifies as a low numerical aperture. The term “Low” is a relative term and can have many ranges. The applicant appears to define by including the limitation that the “low numerical aperture” causes the focused illumination to produce a narrow range of incidence angles in the direction generally transverse to the linear elements of the microstructure, however in general the purpose of including an aperture in an optical device is to produce a narrow range of incidence angles, and the fact that a non-circular aperture is being use would inherently cause the rest. Therefore the term “low numerical aperture” is not defined in such a way that one with ordinary skill in the art would be able to determine what differentiates the applicant’s aperture from any other aperture. Since the specification uses the claim language and does not further clarify the claim language, and any aperture could potentially be read on the claim as now written this claim will not be further search and no prior art will be applied.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 4, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haga et al. (US 6,356,399) further in view of de Groot (US 6,011,624.)

Haga teaches in figure 4 a metrology instrument for samples containing grating-like microstructures thereon (or any other microstructure). The instrument has means (100) for supporting the sample in a measurement relation to the instrument (300). The illumination source (201) directs a light along an illumination path. An aperture (202) is located on the illumination path and an objective lens (204) focuses the light received from the aperture onto the sample, forming a spot on the sample. An optical means (302) is provided for collecting and the detecting the optical signature from the illuminated sample and a processing means is provided for processing the detected optical signature (303). The processing means determines from the detected signature the parameters of interests of the microstructure on the sample. Haga teaches in column 7 lines 5-28 that the processing means determines the best fit to the detected optical signature to a theoretical signature corresponding to a specific set of values for the parameters of interest as is claimed by applicant's claim 5.

Although Haga teaches that the aperture stop is variable, Haga does not necessarily teach that the aperture is an elongated pupil aperture. This however is well

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known improvement over the more common circular aperture. One such example is taught by de Groot, which teaches a device for optical metrology of surfaces. In column 16 lines 1-16 that when using de Groot's invention for Metrology of rough surfaces such as in the present invention it is beneficial for both the source aperture and the imaging apertures to be elongated, because standard apertures cause imaging device to receive insufficient light to produce images of high contrasts. Since de Groot teaches it is well known and advantageous for better imaging when doing Metrology to use elongated apertures in both the imaging and source apertures, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an elongated pupil aperture in the illumination path of Haga's metrology instrument so that it is better able to image and process samples.

With regards to applicant's claim 4, inherently if the aperture is elongated as Haga in view of de Groot teaches then the illumination spot is going to have a narrow dimension and obviously one of ordinary skill in the art will choose to have the axis's of this spot be arrayed in the most efficient and productive manner possible. (For example with a microstructure to be measured that comprises a single row one with ordinary skill in the art would be expected to orient the spot such that it has a narrow dimension corresponding to the width of a single row.)

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,426,502 to Finarov, teaches two elongated apertures (see figure 3a).

US 6,067,162 to Hagen et al. teaches in figure 2 an elongated illumination spot for metrology

US 6,307,635 to Goldberg teaches apertures of various sizes in metrology for measuring microstructures of various shapes as shown in figures 7-9, including one that is a checkerboard type bigrating structure (figure 7c)

US 6,215,551 to Nikoonahad et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T Sever whose telephone number is 703-305-4036. The examiner can normally be reached M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russell Adams can be reached at 703-308-2847. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

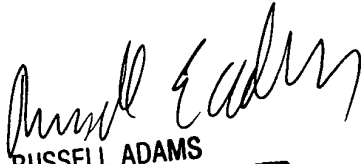


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

AS

April 15, 2003

  
RUSSELL ADAMS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800